1. (Previously presented) A low cost machine vision apparatus for reducing the cost of conventional machine vision products, their inspection and quality control processes by eliminating the need for personal computers and frame grabbers, said apparatus comprising:

a) a lens for directing reflected light from objects upon a sensor array to obtain electronic data in spatial segments representative of said objects;

b) a low cost controller for obtaining the electronic data representative of said reflected light from a selected object and for obtaining data representative of additional reflections of light in spatial segments from additional objects;

c) said controller including a digital logic chip for comparing the data obtained from said selected object with the data representative of additional reflections in accord with an algorithm and for generating a signal indicative of the results of said comparison.

2. (Original) An apparatus as recited in claim 1 in which said apparatus includes an A-D converter for converting the data to digital form and for facilitating said comparison.

3. (Cancelled).

4. (Previously presented) An apparatus as recited in claim 1 in which said controller comprises a microcontroller having a first memory for receiving reflected light from said selected object and a second memory for receiving data representative of the additional reflections.

5. (Previously presented) An apparatus as recited in claim 1 in which said controller is a digital signal processor:

6. (Original) An apparatus as recited in claim 5 in which said controller is programmed to repeatedly obtain additional reflections and to make said comparisons in real time and at high

speed.

7. (Previously presented) A low cost, optical inspection apparatus for optical surface inspection of an object, said apparatus comprising:

a) a lens unit for directing light from an acceptable, standard surface of an object upon a sensor array;

b) a low cost comparator connected to said sensor array and having a first memory for receiving and storing signals representative of the magnitude of the light from the acceptable, standard surface of the object;

c) said comparator having associated additional memory for receiving from said array signals reflecting the magnitude of the light from additional surfaces of the object;

d) said comparator also having a logic unit and a control algorithm for comparing the similarity of the signals of the standard with the signals of the light reflected from additional surfaces of an object and for indicating the results of said comparison.

8. (Previously presented) An optical inspection apparatus as recited in claim 7 in which the signals representative of the standard are taken from along a first line on the leading edge of said object.

9. (Previously presented) An optical inspection apparatus as recited in claim 7 in said sequential signals are taken from segments on the surface of different objects.

10. (Previously presented) An optical inspection apparatus as recited in Claim 7 in which said the results includes identification of a deviation from the acceptable standard surface.

11. (Previously presented) An optical inspection apparatus as recited in Claim 7 in

which said apparatus has an analog to digital converter for converting said signals to digital information.

12. (Previously presented) An apparatus as recited in Claim 7 in which said controller is a Digital Signal Processor.

13. (Previously presented) A low cost, real time, digital diagnostic inspection unit for examining an object, said apparatus comprising:

a) a digital identifier having an associated first memory containing a "standard" electronic information representative of light from spatial segments of an object and a second associated memory containing electronic information representative of light from spatial segments of an object to be inspected;

b) said identifier having a logic unit for comparing the electronic information of the object to be inspected with the standard electronic information and for providing an output signal indicative of similarity of the standard with the object.

14. (Previously Presented) An apparatus as recited in claim 13 in which said standard electronic information is taken from a manufactured part.

15. (Previously Presented) An apparatus as recited in claim 13 in which said digital identifier comprises a digital signal processor.

16. (Previously Presented) An apparatus as recited in claim 13 which includes a means for including spectral electronic information of the reflected light.

17. (Currently amended) A low cost, optical method for inspecting an object, said

method comprising the steps of

a) obtaining digital data representing a spatial distribution of light taken directly from an object and placing same in electronic memory as a standard of comparison;

b) obtaining digital data representing a spatial distribution of light from another object to be inspected and placing same in electronic memory;

c) comparing said digital data of said spatial distribution of the standard of comparison with the digital data of reflected light from said other object through a regression algorithm to determine the similarity and/or dissimilarity of said objects. ~~of light from the segments~~.

18. (Previously Presented) A method as recited in claim 17 in which the spatial distribution includes a color distribution.

19. (Previously Presented) A method as recited in claim 17 in which the spatial distribution comparison includes a full spectrum color comparison.

20. (Previously Presented) A method as recited in claim 17 in which said comparison is performed by an algorithm in a digital comparator.

21. (Currently amended) A low cost, high speed method for surface inspection of plastic, metal, woven and non-woven materials, said method comprising the steps of

a) obtaining digital data representing a spatial distribution of light from a plurality of segments of a line of a material without flaws and placing same in electronic memory as a standard of comparison;

b) obtaining digital data representing a second spatial distribution of light from a plurality of segments along an additional line of said material;

c) comparing said spatial distributions of light to determine the similarity of the standard

of comparison with the additional line of material to identify the presence of flaws, if any.

22. (Previously Presented) A method as recited in claim 21 in which a plurality of spatial distributions of light are taken along surface increments of the materials and are compared at high speeds to determine the conformity of the surface of the material with the standard.

23. (Previously Presented) A method as recited in claim 21 in which spatial distribution includes information pertaining to the color of the material.

24. (Previously Presented) A low cost vision apparatus for detecting a change in conditions, said apparatus comprising:

a) a lens for focusing a spatial distribution of light from a target section representing specific conditions upon a sensor array;

b) a sensor array for receiving said distribution and for generating electronic data representative of said distribution;

c) a comparator for obtaining the electronic data representing the specific conditions and for obtaining electronic data from a sensor array representing subsequent conditions;

d) said comparator containing a logic unit and an algorithm for comparing the specific conditions with the subsequent conditions and for providing a signal indicating the results of the comparison.

25. (Previously Presented) A vision apparatus as recited in claim 24 in which said vision apparatus is mounted as a safety device adjacent a machine press and the specific condition is one in which a person's appendages are not within an unsafe position on the press.

26. (Previously Presented) A vision apparatus as recited in claim 24 in which said vision

apparatus is mounted as a security device adjacent an area to be monitored against unauthorized entry and the specific condition is one in which a person is not within the specific conditions.

27. (Previously Presented) An apparatus as recited in claim 24 in which said sensor array receiving said distribution from said target section is the same as the sensor array representing subsequent conditions.

28. (Previously Presented) An apparatus as recited in claim 24 in which said apparatus has a switch for generating electronic data representative of said distribution of said specific conditions.

29. (Previously Presented) An apparatus as recited in claim 28 said comparator repeatedly compares said specific conditions with said subsequent conditions.

30. (Currently amended) A low cost vision scanning method for the inspection, identification and/or diagnostic evaluation of an objects, tissue, and/or material, said scanning method comprising:

a) <u>simultaneously</u> obtaining digital data reflecting a first spatial distribution of light from an object, tissue, and/or material;

b) repeatedly obtaining digital data reflecting additional spatial distributions of light from other objects, tissue, and/or materials;

c) electronically comparing said first spatial distribution of light with said additional spatial distributions of light <u>with a low cost chip having an arithmetic logic unit</u> to determine the similarity and/or difference between them; and

d) emitting a signal reflecting the similarity and/or difference.